

**PROPOSED REGULATION ORDER MODIFIED TEXT****Amendments to California Zero Emission Vehicle Regulation – Section 1962, Title 13,  
California Code of Regulations – and Related Provisions**

Set forth below are the proposed amendments to the California zero emission vehicle (ZEV) regulation, and the incorporated “California Exhaust Emission Standards and Test Procedures For 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 And Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck And Medium-Duty Vehicle Classes.” The text of the originally proposed amendments is shown in underline to indicate additions and ~~strikeout~~ to indicate deletions. The proposed modifications to the original proposal are shown in double underline to indicate additions and ~~double strikeout~~ to show deletions. The italicized, indented commentaries explain the rationale for the proposed modifications to the original proposal, and are not part of the regulations. Subsection headings shown in *italics* are to be italicized in Barclays California Code of Regulations.

The proposed modifications include (1) modified text specifically approved by the Air Resources Board at the January 25, 2001 hearing, (2) modifications prepared by staff to implement directions from the Board at the hearing, and (3) additional conforming modifications identified by staff. The latter are noted as “post-hearing modifications” in the italicized commentaries.

# PROPOSED REGULATION ORDER WITH MODIFIED TEXT

## AMENDMENTS TO THE CALIFORNIA ZERO-EMISSION VEHICLE REGULATION

Amend section 1962, title 13, California Code of Regulations, to read as follows:

### **§ 1962. Zero-Emission Vehicle Standards for New 2003 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles.**

(a) *ZEV Emission Standard.* The Executive Officer shall certify new 2003 and subsequent model passenger cars, light-duty trucks and medium-duty vehicles as ZEVs if the vehicles produce zero exhaust emissions of any criteria pollutant (or precursor pollutant) under any and all possible operational modes and conditions. Incorporation of a fuel-fired heater shall not preclude a vehicle from being certified as a ZEV provided: (1) the fuel-fired heater cannot be operated at ambient temperatures above 40°F, (2) the heater is demonstrated to have zero fuel evaporative emissions under any and all possible operational modes and conditions, and (3) the emissions of any pollutant from the fuel-fired heater when operated at an ambient temperature between 68°F and 86°F do not exceed the emission standard for that pollutant for a ULEV under section 1961(a)(1).

A vehicle that would meet the emissions standards for a ZEV except that it uses a fuel-fired heater that can be operated at ambient temperatures above 40°F, that cannot be demonstrated to have zero fuel evaporative emissions under any and all possible operation modes and conditions, or that has emissions of any pollutant exceeding the emission standard for that pollutant for a ULEV under section 1961(a)(1), shall be certified based on the emission level of the fuel-fired heater

(b) *Percentage ZEV Requirements.*

(1) General Percentage ZEV Requirement.

(A) Basic Requirement. The minimum percentage ZEV requirement for each manufacturer ~~in 2003 and subsequent model years~~ is listed that at least 10% in the table below as the percentage of the PCs and LDT1s, and LDT2s to the extent required by section (b)(1)(C), produced by the manufacturer and delivered for sale in California that must be ZEVs, subject to the conditions in this section 1962(b).

<u>Model Years</u>	<u>Minimum ZEV Requirement</u>
<u>2003 through 2008</u>	<u>10 percent</u>
<u>2009 through 2011</u>	<u>11 percent</u>
<u>2012 through 2014</u>	<u>12 percent</u>
<u>2015 through 2017</u>	<u>14 percent</u>
<u>2018 and subsequent</u>	<u>16 percent</u>

(B) Calculating the Number of Vehicles to Which the Percentage ZEV Requirement is Applied. A manufacturer's volume of PCs and LDT1s produced and delivered for sale in California will be averaged for the 1997, 1998, and 1999 model years to determine the California PC and LDT1 production volume for the model year 2003 to 2005 ZEV requirements. For subsequent three-year periods following model years 2003 to 2005, a manufacturer's California production volume of PCs and LDT1s, and LDT2s as applicable, production volume will be based on a three-year average of the manufacturer's volume of PCs and LDT1s, and LDT2s as applicable, produced and delivered for sale in California in the prior fourth, fifth and sixth years (e.g. 2006 to 2008 model-year ZEV requirements will be based on California production volumes of PCs and LDT1s, and LDT2s as applicable, production volumes for 2000 to 2002 model years). This production averaging is used to determine ZEV requirements only, and has no effect on a manufacturer's size determination. As an alternative to the three year averaging of prior year production described above, a manufacturer may during the first model year of a three year period elect to base its ZEV obligation on the number of PCs and LDT1s, and LDT2s to the extent required by section (b)(1)(C), produced by the manufacturer and delivered for sale in California that same year. If a manufacturer elects to use this method it must be used for each year of the three-year period. In applying the ZEV requirement, a PC, ~~or LDT1, or LDT2~~ (beginning in the 2007 model year) that is produced by a small volume manufacturer, but is marketed in California by another manufacturer under the other manufacturer's nameplate, shall be treated as having been produced by the marketing manufacturer.

<u>Model Years</u>	<u>Minimum ZEV Requirement</u>
<u>2003 through 2008</u>	<u>10 percent</u>
<u>2009 through 2011</u>	<u>11 percent</u>
<u>2012 through 2014</u>	<u>12 percent</u>
<u>2015 through 2017</u>	<u>14 percent</u>
<u>2018 and subsequent</u>	<u>16 percent</u>

(C) Phase-in of ZEV Requirements for LDT2s. Beginning with the ZEV requirements for the 2007 model year, a manufacturer's LDT2 production shall be included in determining the manufacturer's overall ZEV requirement under section (b)(1)(A) in the increasing percentages shown the table below.

<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012+</u>
<u>17%</u>	<u>34%</u>	<u>51%</u>	<u>68%</u>	<u>85%</u>	<u>100%</u>

**Commentary:** The proposed modifications primarily address two issues:

1. Adding LDT2 Vehicles to Base. The modifications add LDT2 vehicles to the base against which the ZEV requirement is assessed. The inclusion of LDT2 vehicles is phased in beginning in MY 2007 and concluding in 2012. While these vehicles were traditionally used primarily for work purposes, it is now very common for pick-up trucks and sport utility vehicles (SUVs) to be used primarily for personal transportation, i.e. as passenger cars. As such, it is appropriate for LDT2 vehicles to ultimately trigger the same ZEV obligations as passenger cars –

*just as they will be subject to the same emission standards under the LEV II program. Moreover, it is important to avoid situations in which a manufacturer increases its proportional production of LDT2 vehicles in order to reduce its potential ZEV obligations.*

*One of the Board's directives at the January 25 hearing was to double, by 2012, the number of ZEVs required as compared to the original staff proposal. In implementing this directive, staff has accounted for the increased number of required ZEVs that results from phasing in the LDT2 category. Thus the LDT2 phase-in does not increase the number of required ZEVs beyond the number needed to achieve a doubling of the original staff proposal. However, the LDT2 phase-in will increase the overall number of PZEVs or AT PZEVs needed to take full advantage of those options.*

*2. Option to Use Current Model Year as Base Year. Proposed post-hearing modifications allow manufacturers to use the current model year as the base year against which the percentage ZEV requirements are assessed, as was the case under the preexisting regulation. This provides manufacturers with greater flexibility if near-term sales are significantly less than the 1997-99 three year average, which is possible given current economic trends. Manufacturers have already determined which models will be offered as PZEVs for 2003. A decline in the sale of those models could lead to a shortfall when measured against the 1997-99 baseline, even though the percentage requirement would be met if measured against actual 2003 sales. Because manufacturer product lines for 2003 are already fixed, it is too late for them to make adequate adjustments if faced with a significant shortfall.*

*Subsection (b)(1) is also reorganized to enhance clarity.*

*(4)(2) ~~Basic~~ Requirements for Large Volume, Intermediate Volume, Independent Low Volume, and Small Volume Manufacturers.*

*(A) Large Volume Manufacturers. In 2003 and subsequent through 2008 model years, a large-volume manufacturer must meet at least ~~40%~~ 20% of its ZEV requirement with ZEVs, ~~full ZEV allowance vehicles, extended range HEVs,~~ or ZEV credits generated by such vehicles, and at least another 20% with ZEVs, ~~extended range HEVs,~~ advanced technology PZEVs, or credits generated by such vehicles. The remainder of the large-volume manufacturer's ZEV requirement may be met using ~~partial ZEV allowance vehicles~~ PZEVs or credits generated by such vehicles. As the ZEV requirement increases over time (from 10% in model year 2003 to 16% in model year 2018), the maximum portion of the ZEV requirement that may be satisfied by 0.2 allowance PZEVs, or credits generated by such vehicles, is limited to 6% of the manufacturer's applicable California PC, and LDT1, and LDT2 production volume; advanced technology PZEVs or credits generated by such vehicles may be used to meet up to one-half of the manufacturer's remaining ZEV requirement.*

***Commentary:** Given the Board's directive that extended range HEVs should be treated as advanced technology PZEVs rather than ZEVs, the references to extended range HEV as a separate vehicle category are no longer relevant and have been eliminated. Similar conforming changes have been made throughout the regulation.*

(B) *Intermediate Volume Manufacturers.* In 2003 and subsequent model years, an intermediate volume manufacturer may meet its ZEV requirement with up to 100 percent partial ZEV allowance vehicles or credits generated by such vehicles.

(C) *Small Volume Manufacturers and Independent Low Volume Manufacturers.* A small volume manufacturer or an independent low volume manufacturer is not required to meet the percentage ZEV requirements. However, a small volume manufacturer or an independent low volume manufacturer may earn and market credits for the ZEVs, ~~extended range HEVs~~ or ~~ZEV allowance vehicles~~ PZEVs it produces and delivers for sale in California.

~~(2)(3)~~ *Counting ZEVs, ~~Extended Range HEVs~~, and ZEV Allowance Vehicles PZEVs in Fleet Average NMOG Calculations.* ~~Vehicles certified as ZEVs and as full ZEV allowance vehicles shall be counted as ZEVs~~ For the purposes of calculating a manufacturer's fleet average NMOG value and NMOG credits under sections 1961(b) and (c), a vehicle certified as a ZEV or as an extended range HEV is counted as one ZEV, and a Partial ZEV allowance vehicles shall be PZEV is counted as one SULEV certified to the 150,000 mile standards ~~for the purpose of calculating a manufacturer's fleet average NMOG value and NMOG credits under sections 1961(b) and (c), regardless of any ZEV or PZEV multipliers.~~

~~(3)(4)~~ *Implementation Prior to 2003 Model Year.* Prior to the 2003 model year, a manufacturer that voluntarily produces vehicles meeting the ZEV emission standards applicable to 2003 and subsequent model year vehicles may certify the vehicles to those standards and requirements for purposes of calculating fleet average NMOG exhaust emission values and NMOG credits under sections 1961(b) and (c), and for calculating ZEV credits as set forth in section 1962~~(d)~~(g).

~~(4)(5)~~ *Changes in Small Volume, Independent Low Volume, and Intermediate Volume Manufacturer Status.* In 2003 and subsequent model years, if a small volume manufacturer's average California production volume exceeds 4,500 units of new PCs, LDTs, and MDVs based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years, or if an independent low volume manufacturer's average California production volume exceeds 10,000 units of new PCs, LDTs, and MDVs based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years, or if an intermediate volume manufacturer's average California production volume exceeds ~~35,000~~ 60,000 units of new PCs, LDTs, and MDVs based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years, the manufacturer shall no longer be treated as a small volume, independent low volume, or intermediate volume manufacturer, as applicable, and shall comply with the ZEV requirements for independent low volume, intermediate volume or large volume manufacturers, as applicable, beginning with the ~~fourth~~ sixth model year after the last of the three consecutive model years. If

a manufacturer's average California production volume falls below 4,500, 10,000 or ~~35,000~~ 60,000 units of new PCs, LDTs, and MDVs, as applicable, based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years, the manufacturer shall be treated as a small volume, independent low volume, or intermediate volume manufacturer, as applicable, and shall be subject to the requirements for a small volume, independent low volume, or intermediate volume manufacturer beginning with the next model year. In determining small volume manufacturer status, vehicles produced by one manufacturer and marketed in California by another manufacturer under the other manufacturer's nameplate shall be treated as part of the California production volume of the sales of the marketing manufacturer.

***Commentary:** The text of section (b)(5) does not show subsequent amendments, approved by the Board at a June 28, 2001 hearing, that pertain to the effect of joint ownership on small and intermediate volume manufacturers.*

(c) *Partial ~~and Full~~ ZEV Allowance Vehicles (PZEVs).*

(1) Introduction. This section 1962(c) sets forth the criteria for identifying vehicles delivered for sale in California as ~~partial or full ZEV allowance vehicles~~ PZEVs. A ~~partial ZEV allowance vehicle~~ PZEV is a vehicle that ~~is delivered for sale in California and that cannot be certified as a ZEV but qualifies for a partial PZEV allowance of at least 0.2 but less than 1.0. A full ZEV allowance vehicle is a vehicle that is delivered for sale in California and that qualifies for a ZEV allowance of 1.0. An extended range HEV is not treated as a PZEV, and is instead subject to the ZEV multipliers in section 1962(d).~~

(2) *Baseline ~~Partial~~ PZEV Allowance.* In order for a vehicle to be eligible to receive a ~~partial or full~~ PZEV allowance, the manufacturer must demonstrate compliance with all of the following requirements. A qualifying vehicle will receive a baseline ~~partial~~ PZEV allowance of 0.2.

(A) SULEV Standards. Certify the vehicle to the 150,000-mile SULEV exhaust emission standards for PCs and LDTs in section 1961(a)(1) (for model years 2003 through 2006, existing SULEV intermediate in-use compliance standards shall apply to all PZEVs);

(B) Evaporative Emissions. Certify the vehicle to the evaporative emission standards in section 1976(b)(1)(E) ("zero" evaporative emissions standards);

(C) OBD. Certify that the vehicle will meet the applicable on-board diagnostic requirements in section 1968.1 for 150,000 miles; and

(D) Extended Warranty. Extend the performance and defects warranty period set forth in sections 2037(b)(2) and 2038(b)(2) to 15 years or 150,000 miles, whichever occurs first. For HEVs that are advanced technology PZEVs, the traction battery must be included as a warranty item.

**Commentary:** The term “in-use” is added to section (c)(2)(A) to conform with the terminology in section 1961(a)(1). Subsection headings are added here and later in the document for clarity. The added language under Extended Warranty makes clear staff’s intent that the 150,000-mile warranty applies to the batteries used in HEVs.

(3) Zero-Emission VMT Partial PZEV Allowance.

(A) Calculation of Zero Emission VMT Allowance. A vehicle that meets the requirements of section 1962(c)(2) and has zero-emission vehicle miles traveled (“VMT”) capability will generate an additional zero emission VMT PZEV allowance, ~~not to exceed 0.6,~~ according to the following equation calculated as follows:

~~$$\text{Zero-Emission VMT Partial PZEV Allowance} = 0.6 \times \text{Zero-Emission VMT Factor}$$~~

~~where zero-emission VMT factor is the ratio of the zero-emission miles the vehicle travels to the total miles traveled per trip.~~

<u>Urban All-Electric Range</u>	<u>Zero-emission VMT Allowance</u>
<u>&lt; 10 miles</u>	<u>0.0</u>
<u>10 miles to 120 miles</u>	<u>(10 + [0.5 x Urban AER])/35</u>
<u>&gt;120 miles</u>	<u>2.0</u>

~~(B) The zero-emission VMT factor in the above equation is to be calculated as follows, with  $\frac{\text{Urban All-Electric Range (AER)}}{\text{Total Miles Traveled}}$ .~~ The urban all-electric range (AER) shall be determined in accordance with section E.3.(2)(a) of the “California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,” incorporated by reference in section 1962(e)(h).

<u>Urban All-Electric Range</u>	<u>Zero-emission VMT Factors:</u>
<u>&lt;20 miles</u>	<u>0.0</u>
<u>20 miles to &lt; 100 50 miles</u>	<u>(30.5 + [0.5 x Urban AER])/80.30</u>
<u>100 50 miles</u>	<u>1.0</u>

**Commentary:** These modifications are intended to increase the allowance earned by grid-connect HEVs, in keeping with the Board’s directive to provide enhanced incentives for such vehicles within the AT PZEV category. These modifications also will increase the allowance earned by hydrogen fueled internal combustion engine (ICE) vehicles, and reformer fuel cell vehicles.

~~(C)(B)~~ Alternative Procedures. As an alternative to determining the zero-emission VMT allowance factor in accordance with the preceding section 1962(c)(3)(~~BA~~), a manufacturer may submit for Executive Officer approval an alternative procedure for determining the zero-emission VMT potential of the vehicle, along with an engineering evaluation that adequately substantiates the zero-emission VMT determination. For example, an alternative procedure may provide that a vehicle with zero-emissions of one regulated pollutant (e.g. NOx) and not another (e.g. NMOG) will qualify for a zero-emission VMT allowance factor of 0.5 one-half that of a vehicle with zero emissions of all regulated pollutant. ~~Upon approval of the alternative procedure, the Executive Officer shall assign a zero-emission VMT factor not to exceed 1.0.~~

*Commentary: These modifications conform to the modifications to the method for calculating the zero emission VMT allowance in section (c)(3)(A).*

~~(D)(C)~~ Additional Allowances for Qualifying HEVs. The Executive Officer shall approve an additional 0.1 zero-emission VMT partial ZEV allowance for an HEV with an all-electric range ~~greater than 20 miles~~ if the manufacturer demonstrates to the reasonable satisfaction of the Executive Officer that the HEV is equipped with software and/or other strategies that would promote maximum use of off-vehicle charging, and that the strategies employed are reasonably reliable and tamper-proof. ~~In no event, however, may the total zero-emission VMT ZEV allowance for an HEV under section 1962(c)(3) exceed 0.6.~~

(4) Partial PZEV Allowance for Advanced ZEV Componentry. A vehicle that meets the requirements of section 1962(c)(2) but does not qualify for any zero-emission VMT partial PZEV allowance under section 1962(c)(3) ~~shall~~ may qualify for an advanced componentry partial PZEV allowance of 0.1, ~~if the manufacturer demonstrates to the reasonable satisfaction of the Executive Officer that the vehicle is equipped with advanced ZEV componentry such as an advanced battery integral to the operation of the vehicle power train or an electric power train as provided in this section 1962(c)(4).~~

(A) Use of High Pressure Gaseous Fuel or Hydrogen Storage System. A vehicle equipped with a high pressure gaseous fuel storage system capable of refueling at 3600 pounds per square inch or more and operating exclusively on this gaseous fuel shall qualify for an advanced componentry PZEV allowance of 0.1. A vehicle fueled exclusively by hydrogen stored in a high pressure system capable of refueling at 3600 pounds per square inch or more, or stored in nongaseous form, shall also qualify for an advanced componentry PZEV allowance of 0.1.

(B) Other Advanced Componentry. A vehicle shall qualify for an additional advanced componentry allowance if the manufacturer demonstrates to the reasonable satisfaction of the Executive Officer that the vehicle is equipped with advanced ZEV componentry such as an advanced battery integral to the operation of the vehicle power train or an electric power train. The allowance earned by a vehicle shall be calculated according to one of the following methods, as elected by the manufacturer:



1. *CO<sub>2</sub> Reduction Method.*

a. *General.* A vehicle whose operation results in reduced CO<sub>2</sub> emissions as compared to the average vehicle in its class may qualify for an additional advanced componentry allowance in accordance with this section (c)(4)(B)1.. The vehicle's class is determined in accordance with section 1962(e)(3).

b. *Equation for Determining Additional Allowance.* The following equation is used to calculate the additional allowance, provided that in order to earn any additional allowance, the CO<sub>2</sub> Savings must be at least 39,000:

$$\text{Advanced Componentry Allowance} = \text{CO}_2 \text{ Savings} \div 250,000$$

Where:  $\text{CO}_2 \text{ Savings} = (\text{Class Average CO}_2 \text{ Production}) - (\text{Vehicle CO}_2 \text{ Production})$   
 $\text{Vehicle CO}_2 \text{ Production} = (150,000 \div \text{CMPEG}) \times 19.564$   
CMPEG is determined in accordance with section (e)(2)  
Class Average CO<sub>2</sub> Production for the 2000-2007 model years is determined using the following table:

<u><i>Vehicle Class</i></u>	<u><i>Class Average CO<sub>2</sub> Production, 2000-2007 MY</i></u>
<u>Subcompact PC</u>	<u>95,902</u>
<u>Compact PC</u>	<u>96,533</u>
<u>Midsize PC</u>	<u>108,689</u>
<u>Large PC</u>	<u>114,633</u>
<u>Small Truck</u>	<u>117,384</u>
<u>Medium Truck</u>	<u>137,131</u>
<u>Large Truck</u>	<u>161,242</u>

Class Average CO<sub>2</sub> Production for the 2008-2014 model years is determined in accordance with the following equation:

$$\text{Class Average CO}_2 \text{ Production} = (150,000 / \text{Baseline Fuel Economy for model years 2008-2014}) \times 19.564$$

Where: Baseline Fuel Economy for model years 2008-2014 means Baseline Fuel Economy for either the 2008-2011 or 2012-2014 model years, as applicable, as determined in accordance with section (e)(5).

c. *Alternative Method for Determining CO<sub>2</sub> Savings of a Vehicle That Is Not Gasoline-Fueled.* For purposes of the equation in section (c)(4)(B)1.b., the Executive Officer shall approve an alternative method for determining CO<sub>2</sub> savings of a vehicle that is not gasoline-fueled, if the manufacturer submits the alternative method with an engineering evaluation that demonstrates to the reasonable satisfaction of the Executive Officer that the alternative method fairly represents the CO<sub>2</sub> impacts of the vehicle.

2. *Alternative Methods for the 2000 – 2007 Model Years.*

a. *General.* For the 2000-2007 model years only, a manufacturer may elect to have a vehicle's additional advanced componentry allowance determined according to the Efficiency Method in section (c)(4)(B)2.b. or the Peak Power Method in section (c)(4)(B)2.c..

b. *Efficiency Method.* The additional advanced componentry allowance using the efficiency method shall be determined in accordance with the following equation:

$$\text{Advanced Componentry Allowance} = ((\text{CMPEG} / 1.3 * \text{Baseline Fuel Economy}) - 1) * 0.5$$

Where: CMPEG is determined in accordance with section (e)(2).  
Baseline Fuel Economy is determined in accordance with section (e)(4).

c. *Percent Peak Power Method.* The additional advanced componentry allowance using the Percent Peak Power method shall be determined in accordance with the following equation:

$$\text{Advanced Componentry Allowance} = \text{Percentage of "maximum available power" from the electric storage device}$$

Where: Percentage of "maximum available power" means the maximum system power output available from the electrical storage device divided by the sum of the electrical storage device and the SAE net power of the heat engine.

In order to earn any score using the Percent Peak Power method a vehicle must be able to recover kinetic energy through regenerative braking, have idle stop capability, and provide at least 13 percent of "maximum available power" from the electrical storage device.

*Commentary: At the January 25, 2001 public hearing the Board directed that the incentive provided for grid-connect hybrid electric vehicles be increased, within the AT PZEV category. In developing the necessary modifications, staff reviewed the entire set of incentives available for such vehicles, and determined that post-hearing modifications to the advanced ZEV componentry allowance provision also were warranted.*

*The specific modifications in the text above (1) clarify the minimum requirements that must be met in order for a hybrid electric vehicle to earn an allowance for advanced ZEV componentry, and (2) provide an advanced ZEV componentry incentive for gaseous fuel storage, in recognition that such storage systems help provide a pathway towards hydrogen fuel cell vehicles.*

*Under the proposed modifications the long-term advanced componentry scoring method is based on the CO<sub>2</sub> savings that a vehicle achieves versus the average for its class. This metric was chosen because of the effect of global warming on ground level ozone production, and the emerging importance of CO<sub>2</sub> savings as a vehicle technology goal. The proposed modifications provide two other near-term pathways that manufacturers may use in order to earn an advanced componentry allowance, recognizing that manufacturers may pursue a variety of approaches. In the near term (through the 2007 model year), the proposed modifications provide encouragement for CO<sub>2</sub> reduction in absolute terms, for “best in class” efficiency performance within each size and weight classification, and for the degree to which electric drive is used. All of these characteristics are beneficial in and of themselves and as transitions to pure ZEVs.*

*The factor used to convert gallons of fuel saved to CO<sub>2</sub> savings – 19.564 pounds of CO<sub>2</sub> per gallon of fuel – is taken from the Fuel and Energy Source Codes and Emission Coefficients used by the Department of Energy for voluntary reporting of greenhouse gases. This same factor is used by the California Energy Commission in its greenhouse gas inventory.*

(5) ~~Partial~~ PZEV Allowance for Low Fuel-Cycle Emissions. A vehicle that uses fuel(s) with very low fuel-cycle emissions shall receive a ~~partial~~ PZEV allowance not to exceed 0.2. In order to receive the fuel-cycle ~~partial~~ PZEV allowance, a manufacturer must demonstrate to the Executive Officer, using peer-reviewed studies or other relevant information, that NMOG emissions associated with the fuel(s) used by the vehicle (on a grams/mile basis) are lower than or equal to 0.01 grams/mile. Fuel-cycle emissions must be calculated based on near-term production methods and infrastructure assumptions, and the uncertainty in the results must be quantified. The fuel-cycle ~~partial~~ PZEV allowance is calculated according to the following formula:

~~Partial~~ PZEV Fuel Cycle Allowance = 0.2 x [(percent of VMT using fuel(s) meeting the requirements of the preceding paragraph)/ 100]

A manufacturer’s demonstration to the Executive Officer that a vehicle qualifies for a fuel-cycle ~~partial~~ PZEV allowance shall include test results and/or empirical data supporting the estimate of the relative proportion of VMT while operating on fuel(s) with very low fuel-cycle emissions.

**Commentary:** *The nonsubstantive modifications make the terminology consistent.*

(6) Calculation of Combined PZEV Allowance for a Vehicle. The combined PZEV allowance for a qualifying vehicle in a particular model year is the sum of: the PZEV allowances listed in this section 1962(c)(6), multiplied by any PZEV introduction phase-in multiplier or PZEV high efficiency multiplier listed in section 1962(c)(7) (if a 2005 model-year PZEV qualifies for both multipliers listed in section 1962(c)(7), the product of the two multipliers is used as the PZEV multiplier).

(A) Baseline PZEV Allowance. The baseline PZEV allowance of 0.2 for vehicles meeting the criteria in section 1962(c)(2);

(B) Zero Emission VMT PZEV Allowance. The zero-emission VMT PZEV allowance, if any, determined in accordance with section 1962(c)(3), ~~not to exceed 0.6;~~

(C) Advanced ZEV Componentry PZEV Allowance. The advanced ZEV componentry PZEV allowance, if any, determined in accordance with section 1962(c)(4), ~~not to exceed 0.4 0.25;~~ and

(D) Fuel-cycle Emissions PZEV Allowance. The fuel-cycle emissions PZEV allowance, if any, determined in accordance with section 1962(c)(5), ~~not to exceed 0.2.~~

**Commentary:** These modifications reflect the modifications to subsections (c)(3) and (4) above.

(7) PZEV Multipliers.

(A) PZEV Introduction Phase-In Multiplier. Each 2000 through 2005 model-year PZEV that is produced and delivered for sale in California qualifies for a PZEV introduction phase-in multiplier as follows:

	<u>MY 2000-2003</u>	<u>MY 2004</u>	<u>MY 2005</u>
<u>Multiplier</u>	<u>4.0</u>	<u>2.0</u>	<u>1.33</u>

(B) AT PZEV High-Efficiency Multiplier. An AT PZEV qualifies for a full high-efficiency multiplier in accordance with section 1962(e) starting with the ~~2005~~ 2002 model year.

**Commentary:** The proposed model year modification moves up the effective date of the efficiency multiplier for AT PZEVs to the 2002 model year. This conforms to other changes made regarding the calculation of the advanced componentry allowance. As discussed in the commentary to section 1962(e)(1), staff's original intent was that the high-efficiency multiplier be available to ZEVs and AT PZEVs only.

~~(d) Generation and Use of ZEV Credits; Calculation of Penalties. A manufacturer that produces and delivers for sale in California ZEVs, full ZEV allowance vehicles, or partial ZEV allowance vehicles in a given model year exceeding the manufacturer's ZEV requirement set forth in section 1962(b) shall earn ZEV credits in accordance with this section 1962(d).~~

~~(4)~~(d) *Qualification for ZEV Multipliers.*

~~(A)~~(1) *1996-1998 Model-Year ZEV Multipliers.*

~~1.~~(A) *1996-1998 Model-Year ZEV Multiplier Based on Vehicle Range.* 1996-1998 model-year ZEVs shall qualify for a ZEV multiplier based on vehicle range as follows:

<i>ZEV Multiplier</i>	<i>Vehicle Range (miles)</i>	
	<i>Model Years 1996 and 1997</i>	<i>Model Year 1998</i>
2	any	>100
3	70	>130

Range shall be determined in accordance with section 9.f.(2)(a) of the "California Exhaust Emission Standards and Test Procedures for 1988 Through 2000 Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," incorporated by reference in section 1960.1(k).

~~2.~~(B) *1996-1998 Model-Year ZEV Multiplier Based on Specific Energy of Battery.* 1996-1998 model-year ZEVs shall qualify for a ZEV multiplier based on specific energy of the battery as follows:

<i>ZEV Multiplier</i>	<i>Specific Energy of Battery (w-hr/kg)</i>
2	any
3	>40

~~3.~~(C) *Election of Multiplier.* A 1996-1998 model-year ZEV may qualify for a ZEV multiplier according to section 1962(d)(1)(A)~~1.~~ or section 1962(d)(1)~~(A)~~~~2.~~(B), but not both. ~~For purposes of calculating a manufacturer's fleet average NMOG value under section 1960.1(g)(2), each ZEV that qualifies for a ZEV multiplier shall be counted as one vehicle.~~

~~(B)~~(2) *1999-2007 2000 Model-Year ZEV Multiplier Calculation for Extended Electric Range Vehicles.* ~~1.~~ Each ZEV and full ZEV allowance vehicle that is produced and delivered for sale in California in the 1999 ~~to~~ ~~2007~~ 2000 model years and that has an extended electric range shall qualify for a ZEV multiplier as follows:

<i>All-electric range</i>	<i>MY 1999-2000</i>	<i><del>MY 2001-2002</del></i>	<i><del>MY 2003-2005</del></i>	<i><del>MY 2006-2007</del></i>
100-175	6-10	4-6	<del>2-4</del>	<del>1-2</del>

ZEV multipliers under the above schedule will be determined by linear interpolation between the values shown in the above schedule. Range shall be determined in accordance with §section E.3.(2)(a) of the "California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," incorporated by reference in section 1962(e)(h). ZEVs that have a refueling time of less than 10 minutes and a range of 100 miles or more shall be counted as having unlimited all-electric range, and shall consequently earn the maximum allowable ZEV multiplier for a specific model year. ZEVs that have a range of 80 to 99 miles shall qualify for ZEV multipliers in the 1999-2002 2000 model years in accordance with the following equation:

$$\text{ZEV multiplier} = (\text{minimum allowable ZEV multiplier per above table for a model year } \underline{6}) \times (\text{AER equivalent to a 10 minute recharge}/100) \times 0.5.$$

2. ~~For purposes of calculating a manufacturer's fleet average NMOG value under sections 1960.1(g)(2) and 1961(b) and (c), title 13, CCR, each extended electric range ZEV shall be counted as one vehicle.~~

(3) ZEV Multipliers for 2001 and Subsequent Model Years.

(A) ZEV Phase-In Multiplier. Each 2001 to 2005 model-year ZEV ~~and extended range HEV~~ that is placed in service in California qualifies for a ZEV phase-in multiplier as follows:

	<u>MY 2001-2002</u>	<u>MY 2003-2005</u>
<u>Multiplier</u>	<u>4.0</u>	<u>1.25</u>

***Commentary:** Consistent with the Board's directions, the above text does not reflect the staff's proposed modifications to subsections (d)(2) and (3) as distributed on January 25, 2001. Those modifications would have made the proposed ZEV phase-in multiplier retroactive to the 2000 model year.*

(B) ZEV Discount Multiplier for NEVs. Each 2004 and subsequent model-year NEV that is produced and delivered for sale in California is subject to a ZEV discount multiplier for NEVs as follows:

	<u>MY 2004 - MY 2005</u>	<u>MYs 2006 and Subsequent</u>
<u>Discount Multiplier</u>	<u>0.5</u>	<u>0.15</u>

(C) ZEV Extended Electric Range Multiplier.

1. Basic Multiplier Schedule. Each 2001 and subsequent model-year ZEV ~~and extended range HEV~~ that is placed in service in California and that has an extended urban electric range qualifies for a ZEV extended electric range multiplier as follows:

<u>Urban All-Electric Range</u>	<u>Multiplier</u>
<u>&lt; 50 miles</u>	<u>1</u>
<u>&gt; 50 miles to &lt; 275 miles</u>	<u>(Urban AER-25)/25</u>
<u>&gt; 275 miles</u>	<u>10</u>

~~To determine the applicable ZEV range for an extended range HEV, the tested urban all-electric range shall be multiplied by a factor of 3.5. A NEV is not eligible to earn a ZEV extended electric range multiplier. In determining ZEV range multipliers, specialty electric vehicles may, upon Executive Officer approval, be tested at the parameters used to determine the ZEV multipliers for the existing electric vehicle.~~

*Commentary: Deletion of the range multiplier for extended range HEVs is part of the modifications eliminating special treatment of extended range HEVs as a separate vehicle class.*

*The language excluding NEVs from the extended electric range multiplier conforms to the Board's intent that NEVs not earn multipliers other than the early introduction or NEV discount multipliers*

*The post-hearing modification regarding specialty electric vehicles addresses a possible inequity involving fleet electric vehicles such as electric postal vehicles. Such vehicles are modified in order to increase payload and better serve the specific application, but under the ARB test procedures the modified vehicle has a shorter range and therefore would earn fewer credits than the "base" vehicle. With the modification, a special purpose vehicles that use a common platform with a base vehicle can earn the same credit as the base vehicle. A definition of specialty electric vehicle has been added as new section (i)(5).*

2. Fast refueling.

a. Full Fueling in 10 Minutes or Less. A 2008 and earlier model-year ZEV with the demonstrated capability to accept fuel or electric charge until achieving at least 95% SOC or rated fuel capacity in 10 minutes or less when starting from all operationally allowable SOC or fuel states is counted as having unlimited zero emission range and qualifies for the maximum allowable ZEV extended electric range multiplier.

b. At Least 60-Mile Range in Less Than 10 Minutes. A 2008 and earlier model year ZEV with the demonstrated capacity to accept fuel or electric charge equivalent to at least

60 miles of UDDS range when starting from 20% SOC in less than 10 minutes is counted as having 60 additional miles (up to a 275 mile maximum) of UDDS range in the range multiplier determination in section 1962(d)(3)(C)1.

***Commentary:** The original staff proposal provided permanent additional credits for fast refueling. Upon further consideration staff concluded that while these provisions are appropriate in the early years, in later years they would result in too few vehicles being required under compliance scenarios that rely on hydrogen fuel cell vehicles. This would be counter to the Board's directive to equalize in the long term the credits earned by battery EVs and hydrogen fuel cell EVs.*

3. Multiplier Phase Down. Starting with the 2005 model year, the ZEV extended electric range multiplier is phased down to ~~one-half~~ 0.15 of its value in accordance with section 1962(e)(4).

***Commentary:** This modification conforms the language in this section to the modifications described in section 1962(e)(4) below.*

(D) Combined ZEV Multiplier. Starting with the 2001 model year, the combined ZEV multiplier for each ZEV ~~and extended range HEV~~ in a specific model year is the product of:

1. The ZEV phase-in multiplier if any as set forth in section 1962(d)(3)(A); times
2. In the case of a NEV, the ZEV discount multiplier for NEVs if any as set forth in section 1962(d)(3)(B); times
3. The extended electric range multiplier if any as set forth in section 1962(d)(3)(C); ~~and times~~
4. The high efficiency multiplier if any as set forth in section 1962~~(d)~~(e).

***Commentary:** Adding the word "times" makes the originally intended effect clearer. The modification to the section citation corrects an inaccurate cross-reference.*

(2)(E) Effect of ZEV Multipliers. In calculating the number of ZEVs ~~and full ZEV allowance vehicles extended range HEVs~~ produced and delivered for sale in California by a manufacturer in a model year and the ZEV credits from such vehicles, the number of ZEVs ~~and full ZEV allowance vehicles extended range HEVs~~ qualifying for a particular ZEV multiplier shall be multiplied by the combined ZEV multiplier.

(e) ZEV and Advanced Technology PZEV High Efficiency Multipliers

(1) Eligibility. Beginning with the 2005 model year, both ZEVs and advanced technology PZEVs are eligible for a high efficiency multiplier. ~~A NEV or other vehicle unable to maintain the speed and time tolerances contained in 40 CFR 86.115-00 (b)(1) and (2) (as effective July 1, 2000) for at least one cycle of both the UDDS and HFEDS is not eligible to earn~~



an efficiency multiplier. A vehicle earning an efficiency multiplier value of less than 1.00 pursuant to section 1962(ee)(3) will be treated as having an efficiency multiplier of 1.

***Commentary:** The modifications reflect staff's original intent that the efficiency multiplier applies to ZEVs and AT PZEVs only. In addition, staff's intent is that the efficiency multiplier be available to City EVs. The deleted language would have prevented City EVs from qualifying.*

(2) Calculation of CMPEG Rating. For all vehicle types, a CMPEG (California miles per equivalent gallon) rating is determined as follows:

(A) For gasoline-fueled vehicles and HEVs with <20 10 mile zero-emission range, CMPEG = Combined Fuel Economy determined in accordance with 40 CFR Part 600 = 1 / [.55 / (EPA city mpg, unadjusted) + .45 / (EPA highway mpg, unadjusted)].

(B) For BEVs and off-vehicle charge capable HEVs with <20 10 mile zero-emission range, CMPEG = [ 33,705 AC whr/gal / (.55 (AC whr/mile UDDS) + .45 (AC whr/mile HFEDS))] where AC whr/ mile values are determined in accordance with section E.3. "Determination of All-Electric Range-Urban," and "Determination of All-Electric Range-Highway" of the "California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes," as incorporated by reference in section 1962(h). Qualifying HEV CMPEG determination shall be based solely on electric mode operating efficiency for vehicles that are able to maintain test cycle speed and time tolerances for the entire zero-emission range test.

***Commentary:** The modifications reflect modifications to section 2262(c)(3)(A) involving the calculation of allowances for zero emission VMT for grid connect HEVs.*

(C) For vehicles operating on an alternative fuel, including CNG, alcohol, or hydrogen, CMPEG = Combined Fuel Economy as determined in accordance with 40 CFR Part 600. Alternate fuel vehicle CMPEG shall not be compensated with the federal (1/0.15) "fuel content" factor used in determining average fuel economy.

(D) For flexible-fuel or dual-fuel vehicles, CMPEG is the lowest of the federal combined fuel economy values determined for any fuel or fuel mixture on which the vehicle is certified to operate.

~~(3) Determining the high-efficiency multiplier. A high-efficiency multiplier is determined based on the following table.~~

<u>Vehicle Type</u>	<u>Efficiency Multiplier</u>
<del>PCs or LDTs 0-3750 lbs. loaded vehicle weight And fewer than 4 designated passenger seats</del>	<del><math>E = CMPEG / (1.6 * 27.5)</math></del>
<del>PCs or LDTs 0-3750 lbs. loaded vehicle weight And with 4 or more designated passenger seats</del>	<del><math>E = CMPEG / (1.4 * 27.5)</math></del>
<del>LDTs 3751-5750 lbs. loaded vehicle weight And fewer than 4 designated passenger seats</del>	<del><math>E = CMPEG / (1.25 * 27.5)</math></del>
<del>LDTs 3751-5750 lbs. loaded vehicle weight And with 4 or more designated passenger seats</del>	<del><math>E = CMPEG / (1.05 * 27.5)</math></del>
<del>LDTs and LEV I MDVs 5751 lbs. loaded vehicle weight to 8500 lbs. gross vehicle weight</del>	<del><math>E = CMPEG / (0.75 * 27.5)</math></del>

(3) Vehicle classes.

(A) List of vehicle classes. Efficiency multipliers will be determined based on assignment of a vehicle to one of the following vehicle classes; interior volume is determined in accordance with SAE Recommended Practice J1100 and U.S. EPA Fuel economy regulations, 40 CFR 600.315-82.

<u>Vehicle Class</u>	<u>Class Description</u>
<u>City Vehicle</u> <u>(effective beginning in 2008</u> <u>model year)</u>	<u>2 passenger electric vehicle</u> <u>with length &lt; 3 meters</u>
<u>Subcompact PC</u>	<u>Interior volume</u> <u>up to 99 ft<sup>3</sup>, and not a City</u> <u>Vehicle</u>
<u>Compact PC</u>	<u>Interior volume</u> <u>100-109 ft<sup>3</sup></u>
<u>Midsize PC</u>	<u>Interior volume</u> <u>110- 119 ft<sup>3</sup></u>
<u>Large PC</u>	<u>Interior volume</u> <u>over 120 ft<sup>3</sup></u>
<u>Small Truck</u>	<u>LDT 1</u>
<u>Medium Truck</u>	<u>LDT 2</u>
<u>Large Truck</u>	<u>LDT 3 &amp; 4</u>

(B) Assignment of derivative or converted vehicles. A derivative station wagon shall be placed in the same class as the sedan on which it is based. A minivan shall be placed in the appropriate truck category based on adjusted or adjusted loaded vehicle weight. A derivative or

conversion ZEV that shares a production platform with one or more gasoline engine versions shall be placed in the same class as the smallest or lightest gasoline version of the same platform for that model year.

(4) *High efficiency multipliers for the 2002-2007 model years.* For model years 2002-2007, the efficiency multiplier for each vehicle class is determined according to the following equation:

$$\text{High Efficiency Multiplier} = \text{CMPEG} / 1.5 * \text{Baseline Fuel Economy}$$

Where: Baseline Fuel Economy is determined in accordance with the following table:

<u><i>Vehicle Class</i></u>	<u><i>Baseline Fuel Economy MY 2002-2007</i></u>
<u>Subcompact PC</u>	<u>30.6</u>
<u>Compact PC</u>	<u>30.4</u>
<u>Midsize PC</u>	<u>27.0</u>
<u>Large PC</u>	<u>25.6</u>
<u>Small Truck</u>	<u>25.0</u>
<u>Medium Truck</u>	<u>21.4</u>
<u>Large Truck</u>	<u>18.2</u>

(5) *High efficiency multipliers for the 2008-2014 model years.* For model years 2008-2014, the efficiency multiplier for each vehicle class is determined in accordance with the following equations:

For ZEVs and PZEVs with > 10 mile Zero Emission Range: Efficiency multiplier = CMPEG / (2.0 \* Baseline Fuel Economy)

For all other AT PZEVs: Efficiency multiplier = CMPEG / (15 \* Baseline Fuel Economy)

Where: *Baseline Fuel Economy* for model years 2008-2011 is the model year 2004 unadjusted-combined federal sales-weighted fuel economy for the vehicle class as determined by U.S. EPA. For a City Vehicle, the baseline fuel economy is 45.9.

*Baseline Fuel Economy* for Model Years 2012-2014 is the model year 2008 unadjusted-combined federal sales-weighted fuel economy for the vehicle class as determined by U.S. EPA. For a City Vehicle, the baseline fuel economy is 45.9.

**Commentary:** *The proposed modifications address three issues:*

1. Revised vehicle categories and baseline efficiency benchmarks. *The revised language redefines the vehicle categories and baseline efficiency benchmarks used to calculate the efficiency credit. The modified proposal is based on vehicle categories used in U.S. EPA fuel economy labeling. These categories are more familiar to manufacturers and the public, and provide for somewhat finer differentiation across vehicle types. The mileage figures used in the model year 2002-2007 calculations are based on U.S. EPA's unadjusted-combined sales-weighted fuel economy values for MY 2000. The modified proposal for those years also uses benchmarks based upon a 50 percent improvement over the sales-weighted fuel economy of vehicles in each category. This is a more consistent and easily understood approach.*

*These modifications are intended to improve the calculation methodology, but not significantly affect the resulting scores. Because the passenger car group is split into four categories under the modified proposal, as opposed to the two original categories, there would be a greater spread of benchmark values for passenger cars. As a result, the benchmarks for small passenger cars ("subcompact" and "compact" using the revised categories) are higher here than under the original staff proposal. Such vehicles therefore receive somewhat lower efficiency scores under the modified proposal.*

*As is shown in the following table, however, the estimated efficiency scores obtained under the modified method in general are similar to those obtained under the original staff proposal:*

<i>Vehicle</i>	<i>CMPEG</i>	<i>Class</i>	<i>Class MPG</i>	<i>Efficiency Multiplier (revised)</i>	<i>Efficiency Multiplier (original)</i>
<i>Insight</i>	<i>76.5</i>	<i>Subcompact</i>	<i>30.6</i>	<i>1.67</i>	<i>1.74</i>
<i>Prius</i>	<i>57.7</i>	<i>Compact</i>	<i>30.4</i>	<i>1.27</i>	<i>1.5</i>
<i>Escape</i>	<i>41.2</i>	<i>Medium Truck</i>	<i>21.4</i>	<i>1.28</i>	<i>1.43</i>
<i>eCom</i>	<i>127.4</i>	<i>Subcompact</i>	<i>30.6</i>	<i>2.78</i>	<i>2.90</i>
<i>RAV4 EV</i>	<i>102.6</i>	<i>Small Truck</i>	<i>25.0</i>	<i>2.74</i>	<i>2.68</i>
<i>2000 Altra</i>	<i>121.9</i>	<i>Large</i>	<i>25.6</i>	<i>2.86</i>	<i>2.85</i>

2. New efficiency category for City Vehicles. *As a separate post-hearing change, the modifications establish, effective in the 2008 model year, a new efficiency category for City Vehicles. At the January 25, 2001 hearing the Board directed staff to prepare modifications that double the number of vehicles required in 2012 and beyond, as compared to the original staff proposal. In developing the necessary modifications staff estimated the effect of such modifications on the*

*number of vehicles required assuming (1) 100 percent full function EVs, and (2) a 50/50 mix of full function EVs and City EVs. In reviewing the effect of various approaches, it became apparent that the relatively high efficiency scores earned by City EVs in later years when the efficiency multiplier is fully phased in would reduce the number of vehicles required under a 50/50 mix. The high level of efficiency credit earned by City EVs was in part due to the fact that they are being compared to larger vehicles. Under the original staff proposal, City Vehicles are treated as subcompacts, which is at present the smallest category of US vehicle. In fact, however, City Vehicles are much smaller than the typical subcompact. Therefore it is not surprising that they have higher fuel economy, apart from any inherent efficiency.*

*To address this issue, and reduce the discrepancy between FFEV vehicle totals and 50/50 mix vehicle totals, staff proposes to establish a new efficiency category for City Vehicles. To avoid disrupting manufacturer product planning, and to ensure that City Vehicles receive significant incentives in the early years, this new efficiency category will not take effect until 2008.*

*The category consists of two-passenger electric vehicles with a length of less than 3 meters. To establish the baseline fuel economy for this category, staff reviewed fuel economy information for Japanese K class and European A class vehicles, which are the closest approximation to City Vehicles. Based on the information available the baseline fuel economy for the City Vehicle class would be set at 45.9 mpg. This is 50 percent greater than current value for the subcompact category.*

*3. Separate efficiency calculation for ZEVs for MY 2008 and beyond. The creation of a separate efficiency calculation for ZEVs, beginning in MY 2008, sets a higher efficiency benchmark for ZEVs in keeping with their inherently higher efficiency. This modification reduces the efficiency scores in future years, and also reduces the sensitivity of the calculation method to changes in efficiency. The effect of this change is to provide greater certainty that future vehicle totals will hit the targets established by the Board. This change is delayed until the 2008 model year to avoid disrupting manufacturers' near-term compliance planning. This change will also affect the scores for AT PZEVs with a zero emission range of 10 miles or more (grid connect hybrid vehicles, reformer fuel cell vehicles, and hydrogen ICE vehicles).*

~~(4)(6)~~ *Phasing in the High Efficiency Multiplier for ZEVs.*

~~(A) *Range and Efficiency Phasing Factors.* For ZEVs and extended range HEVs, the high efficiency multiplier is phased in, and the extended electric range multiplier is phased down to one-half 0.15 of its initial value, by multiplying the multipliers by the values using the phasing factors in the following schedule:~~

	<u>MY 2004</u>	<u>MY 2005</u>	<u>MY 2006</u>	<u>MY 2007</u>	<u>MYs 2008 and Subsequent</u>
<u>Range Multiplier</u>	<u>1.0</u>	<u>0.875</u>	<u>0.75</u>	<u>0.625</u>	<u>0.5</u>
<u>Efficiency Multiplier</u>	<u>0.0</u>	<u>.25</u>	<u>.5</u>	<u>.75</u>	<u>1.0</u>

Range and Efficiency Phasing Factors for Each Model Year

	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012+</u>
<u>Range</u>	<u>1.000</u>	<u>0.825</u>	<u>0.600</u>	<u>0.450</u>	<u>0.300</u>	<u>0.250</u>	<u>0.200</u>	<u>0.200</u>	<u>0.150</u>
<u>Efficiency</u>	<u>0.000</u>	<u>0.100</u>	<u>0.350</u>	<u>0.550</u>	<u>0.600</u>	<u>0.700</u>	<u>0.800</u>	<u>0.800</u>	<u>0.825</u>

(B) Application of the Range and Efficiency Phasing Factors. The range and efficiency phasing factors are applied as follows:

$$\text{Phased range multiplier} = ((\text{range multiplier} - 1) \times \text{range phasing factor}) + 1$$

$$\text{Phased efficiency multiplier} = ((\text{efficiency multiplier} - 1) \times \text{efficiency phasing factor}) + 1$$

**Commentary:** *The proposed modifications address three issues.*

1. Calculation of efficiency phase-in and range phase-out. Under the January 25 modified staff proposal, the phase-in of the efficiency multiplier and the phase-out of the range multiplier are applied to the entire efficiency and range score. For example, if a vehicle earns an efficiency score of 2.0, to calculate the applicable efficiency multiplier for 2005 the 2005 efficiency phase-in factor (0.25) is applied to that entire score, resulting in a value of 0.5. Similarly, if the range score is 2.5, the 2005 phase-out factor for range (0.85) is applied to that entire score, resulting in a value of 2.125. The efficiency and the range scores are then added (0.5 + 2.125), resulting in a final value of 2.625.

Upon further review, staff has concluded that this method gives undesirable results in some situations, and we have determined that instead it is better to phase only that portion of the efficiency or range score that is greater than 1.0. Using the above example, an efficiency score of 2.0 and a phase-in value of 0.25 would result in a multiplier of 1.25 (1.0 plus (0.25 x the increment of the efficiency credit that is greater than 1.0)). The range score of 2.5 with a phase-out value of 0.85 would result in a multiplier of 2.275 (1.0 plus (0.85 x the increment of the range score that is greater than 1.0)). These values would then be multiplied (instead of added), for a final combined value in this example of 2.84. Although this value is quite close to the 2.625 calculated under the previous mechanism, that is not always the case. The revised method results in scores that make more sense across the full range of possible vehicle characteristics.

2. Near-term phase-in and phase-out factors. When staff proposed the efficiency multiplier, our intent was that the application of the multiplier would not significantly affect the average credit earned by a full function EV. We expected the credit for any particular vehicle to increase or decrease depending on its relative efficiency, but overall we wanted to keep the average credits roughly the same before and after the introduction of the efficiency multiplier. This approach was intended to ensure that the efficiency multiplier would not affect the required number of full function vehicles.

After reviewing the effect of the revised calculation method, staff has determined that on average the phasing factors used in the January 25 modified proposal resulted in combined credit scores that are higher in MY 2007 than in MY 2004. This means that the number of vehicles needed in 2007 and beyond would decline. In addition, we determined that these values do not produce smooth transitions from year to year. Rather, the scores in MYs 2005 and 2006 jump up sharply, then decline in MYs 2007 and 2008.

The modified phase in and phase out values shown in section (e)(6) above are designed to provide a smooth transition, and would result in average MY 2007 scores for full function EVs that are roughly equivalent to average MY 2004 scores.

3. Long term phase-in and phase-out factors. At the January 25 hearing, the Board directed staff to develop modifications that result in a doubling of the number of ZEVs required, as compared to the original staff proposal, by MY2012. A portion of this increase occurs as the result of the inclusion of LDT2 vehicles in the base against which the ZEV obligation is assessed. In order to accomplish the remainder of the necessary increase in the number of vehicles required, the modifications now being made available reflect further adjustments to the phasing of the efficiency and range multipliers. The MY 2008 values for these multipliers, as shown above, are 0.3 for range and 0.600 for efficiency, compared to 0.5 and 1.0 respectively in the 2008 and subsequent model years under the original proposal. The modifications also incrementally adjust the phase-in factors after MY 2008 until they reach 0.15 and 0.825 for range and efficiency respectively in the 2012 and subsequent model years.

While developing these proposed modifications, staff also made an internal calculation change with respect to the assumed efficiency of future ZEVs. In order to have a consistent basis for estimating vehicle totals, throughout the biennial review process staff assumed that the future vehicle fleet would be identical to the current (MOA) vehicles offered by manufacturers. Using this methodology, future increases in vehicle efficiency will result in reduced numbers of vehicles required. In order to provide a greater likelihood that the actual number of vehicles produced will hit the target established by the Board at the January 25 hearing (2 times the staff proposal), staff in this proposal assumed that for 2008 and beyond the average full function vehicle has range and efficiency characteristics identical to today's RAV 4 EV. For City EVs staff assumed that future vehicles have the same performance as the e-Com. Introducing these revised

*assumptions reduces the likelihood that future range or efficiency gains will result in a shortfall of vehicles as compared to the board's target.*

*These modified phase-in values result in estimated vehicle totals for 2012 and beyond that are roughly equal to 2 times the original staff proposal. Staff notes that due to the effect of the efficiency multiplier, the relationship between the number of vehicles required and the "red line" (2 times the staff proposal) differs for a 100 percent full function vehicle scenario as compared to a 50/50 mix of full function and City EVs. Staff has chosen factors that result in a full function total that is about 106 percent of the red line, and a 50/50 mix total that is about 93 percent of the red line. Thus these two scenarios evenly "bracket" the red line target.*

*(f) In-Service Warranty Multiplier for ZEVs and PZEVs With \$2010 Mile Zero Emission Range. Except in the case of a NEV, an additional ZEV or PZEV multiplier will be earned for the 2001 through 2011 model years by a ZEV or a PZEV with \$2010 mile zero emission range whose zero-emission energy storage or conversion system is under an original warranty from the vehicle manufacturer beyond three years of service and is registered for operation on public roads in California. For the 2001 through 2007 model years, a manufacturer will receive 0.1 times the original ZEV credit earned by the vehicle if it were leased or sold new in that year, including multipliers, ~~(including multipliers other than the ZEV phase-in multiplier in section 1962(d)(3)(A) and the PZEV introduction phase-in multiplier in section 1962(e)(7))~~ on a year-by-year basis beginning in the fourth year. For the 2008 through 2011 model years, a manufacturer will receive 0.05 times the original ZEV credit earned by the vehicle if it were leased or sold new in that year, including multipliers, on a year-by-year basis beginning in the fourth year. The warranty multiplier is reported and earned in the year following each continuous year of service.*

***Commentary:** The proposed modifications tie the credit earned by a vehicle under an extended warranty to the credit that would be earned by a new vehicle in that same year, better reflecting the relative value of the vehicle to the manufacturer. This has the effect of increasing the value of the warranty credit in early years and reducing it in later years. Thus the modifications will increase the effective number of vehicles required in later years and mitigate an effect that could work against the doubling of vehicles that was directed by the Board.*

*The proposed modifications also phase out the in-service multiplier. The potential number of credits earned each year under this warranty increase over time, due to the increasing number of vehicles on the road. Phasing out the warranty credit in 2012 provides greater certainty that the number of vehicles delivered for sale in future years will meet the targets established by the Board.*

*Under the modified language, "re-leased" vehicles (for example MOA vehicles or vehicles that had originally been leased in other states) are eligible to earn the extended warranty credit.*



(g) Generation and Use of ZEV Credits; Calculation of Penalties

(1) Introduction. A manufacturer that produces and delivers for sale in California ZEVs or PZEVs in a given model year exceeding the manufacturer's ZEV requirement set forth in section 1962(b) shall earn ZEV credits in accordance with this section 1962(g).

~~(3)~~(2) ZEV Credit Calculations.

(A) Credits from ZEVs and Full ZEV Allowance Vehicles ~~Extended Range HEVs.~~ ~~An full ZEV allowance vehicle extended range HEV shall be is treated as a ZEV in calculating and applying ZEV credits.~~ The amount of ZEV credits earned by a manufacturer in a given model year from ZEVs shall be expressed in units of g/mi NMOG, and shall be equal to the number of ZEVs produced and delivered for sale in California that the manufacturer applies towards meeting the ZEV requirements for the model year ~~(at least 40% of the ZEV requirement for a large volume manufacturer)~~ subtracted from the number of ZEVs produced and delivered for sale in California by the manufacturer in the model year and then multiplied by the NMOG fleet average requirement for PCs and LDT1s for that model year.

(B) Credits from Partial ZEV Allowance Vehicles ~~PZEVs.~~ The amount of ZEV credits from ~~partial ZEV allowance vehicles~~ PZEVs earned by a manufacturer in a given model year shall be expressed in units of g/mi NMOG, and shall be equal to the total number of PZEV allowances from ~~partial ZEV allowance vehicles~~ PZEVs produced and delivered for sale in California that the manufacturer applies towards meeting its ZEV requirement for the model year ~~(a number not to exceed 60% of the ZEV requirement for large volume manufacturers)~~ subtracted from the total number of PZEV allowances from ~~partial ZEV allowance vehicles~~ PZEVs produced and delivered for sale in California by the manufacturer in the model year and then multiplied by the NMOG fleet average requirement for PCs and LDT1s for that model year.

(C) Separate Credit Accounts. The number of credits from a manufacturer's [i] ZEVs ~~and full ZEV allowance vehicles extended range HEVs,~~ [ii] advanced technology PZEVs, and [iii] all other PZEVs shall each be maintained separately ~~from the number of credits from the manufacturer's partial ZEV allowance vehicles.~~

~~(4)~~(3) ZEV Credits for MDVs and LDTs other than LDT1s. ~~ZEVs, extended range HEVs and PZEVs~~ ZEVs and PZEVs classified as MDVs or as LDTs other than LDT1s may be counted toward the ZEV requirement for PCs and LDT1s, and included in the calculation of ZEV credits as specified in this section 1962~~(d)~~(g) if the manufacturer so designates.

(4) ZEV Credits for Advanced Technology Demonstration Programs. A vehicle placed in a California advanced technology demonstration program may earn ZEV credits even if it is not "delivered for sale." To earn such credits, the manufacturer must demonstrate to the reasonable satisfaction of the Executive Officer, ~~prior to certification,~~ that the vehicles will be regularly used in applications appropriate to evaluate issues related to safety, infrastructure, fuel specifications or public education. Such a vehicle is eligible to receive the same allowances and credits that it would have earned if placed in service. To determine vehicle credit, the model-

year designation for a demonstration vehicle shall be consistent with the model-year designation for conventional vehicles placed in the same timeframe.

***Commentary:** These modifications remove the requirement that demonstration program vehicles be certified, to allow credit for vehicles placed under experimental permits. They also clarify the regulation's treatment of demonstration vehicles that do not have clearly defined "model years".*

(5) ZEV Credits for Transportation Systems.

(A) General. In model years 2001 through 2007, a ZEV, advanced technology PZEV or PZEV or extended range HEV placed as part of a transportation system may earn additional ZEV credits, which may used in the same manner as other credits earned by vehicles of that category, except as provided in section (g)(5)(C) below from advanced technology PZEVs. A NEV is not eligible to earn credit for transportation systems. To earn such credits, the manufacturer must demonstrate to the reasonable satisfaction of the Executive Officer, prior to certification, that the vehicle will be used as a part of a project that uses an innovative transportation system, that will effectively link homes, transit systems and jobs (e.g. a station car). Such systems are to be designed to evaluate the benefits and issues related to the

(B) Credits Earned. In order to earn additional credit under this section (g)(5), a project must at a minimum demonstrate [i] shared use of ZEVs, AT PZEVs or PZEVs, and [ii] the application of "intelligent" new technologies such as reservation management, card systems, depot management, location management, charge billing and real-time wireless information systems. The additional ZEV credit may not exceed the original ZEV credit earned by the vehicle, including multipliers other than the ZEV phase-in multiplier in section 1962(d)(3)(A). If, in addition to factors [i] and [ii] above, a project also features linkage to transit, the project may receive further additional credit. The maximum credit awarded per vehicle shall be determined by the Executive Officer, based upon an application submitted by the manufacturer and, if appropriate, the project manager. The maximum credit awarded shall not exceed the following:

<u>Type of Vehicle</u>	<u>Shared Use, Intelligence</u>	<u>Linkage to Transit</u>
<u>PZEV</u>	<u>2</u>	<u>1</u>
<u>Advanced Technology PZEV</u>	<u>4</u>	<u>2</u>
<u>ZEV</u>	<u>6</u>	<u>3</u>

(C) Cap on Use of Credits.

1. ZEVs. Credits earned or allocated by ZEVs pursuant to this section (g)(5), including all credits earned by the vehicle itself, may be used to satisfy up to one-tenth of a manufacturer's ZEV obligation in any given model year.

2. AT PZEVs. Credits earned or allocated by AT PZEVs pursuant to this section (g)(5), including all credits earned by the vehicle itself, may be used to satisfy up to one-

twentieth of a manufacturer's ZEV obligation in any given model year, but may only be used in the same manner as other credits earned by vehicles of that category.

3. PZEVs. Credits earned or allocated by PZEVs pursuant to this section (g)(5), including all credits earned by the vehicle itself, may be used to satisfy up to one-fiftieth of the manufacturer's ZEV obligation in any given model year, but may only be used in the same manner as other credits earned by vehicles of that category.

(D) Allocation of Credits. Credits shall be assigned by the Executive Officer to the project manager or, in the absence of a separate project manager, to the vehicle manufacturers upon demonstration that a vehicle has been placed in a project. Credits shall be allocated to vehicle manufacturers by the Executive Officer in accordance with a recommendation submitted in writing by the project manager and signed by all manufacturers participating in the project, and need not be allocated in direct proportion to the number of vehicles placed.

*Commentary: The January 25 staff proposal provided additional credit for vehicles placed in transportation systems. Such systems have the potential to reduce emissions, encourage transit use, reduce vehicle miles traveled and congestion, and relieve parking problems. At the public hearing, the Board directed staff to pursue an implementation partnership and other measures to further encourage the introduction of such systems in California. In following up on the Board's directive, staff has prepared modifications intended to encourage the development of a few such systems, which then can be evaluated in terms of their air quality and transportation impact.*

*Under the original staff proposal, this credit was only available to ZEVs and grid connect hybrid vehicles, was capped at twice the base value of the vehicle excluding any early introduction multipliers, and could only be used within the middle two percent. In order to provide additional incentive for such projects, the following modifications are proposed:*

*Allow other vehicle types to earn transportation system credit. AT PZEVs and PZEVs can earn additional credit if placed in transportation system programs. The language excluding NEVs conforms to the Board's intent that NEVs not earn additional credit other than the early introduction multiplier.*

*Allow transportation system credit earned by ZEVs to satisfy the top 2 percent. The transportation system credit earned by a vehicle is available for use in the same manner as other credits earned by that vehicle. For example, transportation system credit earned by a ZEV can be used to satisfy the top 2 percent, credit earned by AT PZEVs can be used towards the middle 2 percent, and credit earned by PZEVs can be used towards the 6 percent.*

*Increase the transportation system credits available. The additional credits available for vehicles placed in a transportation system are increased to a maximum of 9 for a ZEV, 6 for an AT PZEV, or 3 for a PZEV.*

Cap the maximum allowable use of such credits in any given year. Credits earned by ZEVs, AT PZEVs, or PZEVs, including the credits earned by the vehicle itself, can only be used to satisfy a portion of the manufacturers obligation (one tenth each for ZEVs, one twentieth for AT PZEVs, and one fiftieth for PZEVs), and could only be used in the same manner as credits earned by other vehicles of that category.

Establish a credit allocation process. It is likely that many transportation system projects will involve more than one vehicle manufacturer. In such projects, manufacturers may make different contributions – for instance, one may provide vehicles only, while another may provide vehicles, system software, and technical assistance. To accommodate the variety of possible approaches and provide maximum flexibility, staff proposes to separate the “generation” of credits from the “allocation” of credits:

- Credits are “generated” by vehicles placed in a project, according to the characteristics of the project. For example, imagine a project involving 50 ZEVs (25 from manufacturer A and 25 from Manufacturer B). If the project meets all criteria, then all ZEVs placed in the project would earn the maximum credit level available (9 per vehicle), resulting in a total of 450 credits. These credits are assigned to the project manager.
- Credits are “allocated” by the project manager, in keeping with the contributions of each manufacturer. Using the example given above, if Manufacturer A provided software and in-kind contributions, and Manufacturer B only provided vehicles, the project manager could decide to award 300 credits to Manufacturer A and 150 to Manufacturer B. Alternatively, the project manager and manufacturers could agree to allocate 400 credits to participating manufacturers and reserve 50 credits to be marketed by the project manager. All parties to the project would need to agree on the proposed allocation. ARB then would assign credits to individual manufacturers based upon a written proposed allocation from the project manager, signed by the manufacturers involved.

Sunset the credit mechanism after the 2007 model year. The proposed approach is intended to encourage experimentation with transportation system projects. The proposed modifications sunset the enhanced credits after the 2007 model year, such that a future Board action will be needed to continue them at the appropriate level. This makes clear that the near-term credit levels are not intended to continue indefinitely, but rather should be reviewed when we have real-world data regarding VMT, trip reduction, transit substitution patterns, and other relevant factors. If appropriate, modifications would be introduced.

~~(5)~~(6) Submittal of ZEV Credits. A manufacturer may meet the ZEV requirements in any given model year by submitting to the Executive Officer a commensurate amount of ZEV

credits consistent with section 1962(b). These credits may be earned previously by the manufacturer or acquired from another manufacturer. The amount of ZEV credits required to be submitted shall be calculated according to the criteria set forth in this section 1962(d)(g).

~~(6)~~(7) *Requirement to Make Up a ZEV Deficit.*

(A) General. A manufacturer that produces and delivers for sale in California fewer ZEVs than required in a given model year shall make up the deficit by the end of the next model year by submitting to the Executive Officer a commensurate amount of ZEV credits, except that credits generated from PZEVs may be used to offset deficits for two model years. The amount of ZEV credits required to be submitted shall be calculated by ~~(A)~~ [i] adding the number of ZEVs ~~and extended-range HEVs~~ produced and delivered for sale in California by the manufacturer for the model year to the number of ZEV allowances from partial ZEV allowance vehicles produced and delivered for sale in California by the manufacturer for the model year ~~(not to exceed 60% of for a large volume manufacturer's ZEV requirement, not to exceed that permitted under section 1962(b)(2)),~~ ~~(B)~~ [ii] subtracting that total from the number of ZEVs required to be produced and delivered for sale in California by the manufacturer for the model year, and ~~(C)~~ [iii] multiplying the resulting value by the fleet average requirements for PCs and LDTs for the model year in which the deficit is incurred.

(B) Additional Time to Make Up ZEV Deficits for the 2003-2004 Model Years.

1. Model-Year 2003 ZEV Deficits. A manufacturer that produces, and delivers for sale in California, model-year 2003 or earlier PZEVs that generate at least twice as many credits as are necessary to take full advantage of the manufacturer's 60% PZEV option for the 2003 model year has through the 2007 model year to fully exercise its option to meet an additional 20% of its ZEV requirement for the 2003 model year with credits from advanced technology PZEVs.

2. Model-Year 2004 ZEV Deficits. A manufacturer that qualifies under section 1962(g)(7)(B) 1., and produces, and delivers for sale in California, model-year 2004 or earlier PZEVs that generate at least twice as many credits as are necessary to take full advantage of the manufacturer's 60% PZEV option for the 2003 and 2004 model years, has through the 2008 model year to fully exercise its option to meet an additional 20% of its ZEV requirement for the 2004 model year with credits from advanced technology PZEVs.

~~(7)~~(8) *Penalty for Failure to Meet ZEV Requirements.* Any manufacturer that fails to produce and deliver for sale in California the required number of ZEVs or submit an appropriate amount of ZEV credits and does not make up ZEV deficits within the specified time period shall be subject to the Health and Safety Code section 43211 civil penalty applicable to a manufacturer that sells a new motor vehicle that does not meet the applicable emission standards adopted by the state board. The cause of action shall be deemed to accrue when the ZEV deficits are not balanced by the end of the specified time period. For the purposes of Health and Safety Code section 43211, the number of vehicles not meeting the state board's standards shall be calculated according to the following equation, provided that ~~no more than 60% the percentage~~ of a large volume manufacturer's ZEV requirement for a given model year that may be satisfied

with partial ZEV allowance vehicles or ZEV credits from such vehicles may not exceed the percentages permitted under section 1962(b)(2)(A):

(No. of ZEVs required to be produced and delivered for sale in California for the model year) - (No. of ZEVs produced and delivered for sale in California for the model year) - (No. of ZEV allowances from partial ZEV allowance vehicles produced and delivered for sale in California for the model year) - [(Amount of ZEV credits submitted for the model year) / (the fleet average requirement for PCs and LDT1s for the model-year)].

~~(e)~~(h) *Test Procedures.* The certification requirements and test procedures for determining compliance with this section 1962 are set forth in “California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,” adopted by the state board on August 5, 1999, and last amended [Insert date of amendment], which is incorporated herein by reference.

(i) ZEV-Specific Definitions. The following definitions apply to this section 1962.

(1) “Advanced technology PZEV” or “AT PZEV” means any PZEV with an allowance greater than 0.2 of 0.4 or higher (before the application of any the PZEV early introduction phase-in multiplier or the high efficiency multipliers).

*Commentary: This modification conforms to the previous modification involving the calculation of the advanced componentry allowance. This modification provides that a vehicle receiving an advanced componentry allowance will still be considered an AT PZEV, even if it receives a score of less than 0.4. (Under the original scoring mechanism, it was not possible to earn a score between 0.2 and 0.4. Under the modified mechanism, intermediate scores are possible. Staff intends that vehicles receiving such scores still qualify as AT PZEVs.)*

(2) “Battery electric vehicle” means any vehicle that operates solely by use of a battery or battery pack, or that is powered primarily through the use of an electric battery or battery pack but uses a flywheel or capacitor that stores energy produced by the electric motor or through regenerative braking to assist in vehicle operation.

~~(3) “Extended range HEV” means an HEV that meets the criteria in section 1962(e)(2) for a PZEV allowance of 0.2 and has a minimum urban zero-emissions range of at least 20 miles attributable to off-vehicle recharging.~~

~~(4)~~(3) “Neighborhood electric vehicle” means a motor vehicle that meets the definition of Low-Speed Vehicle either in section 385.5 of the Vehicle Code or in 49 CFR 571.500 (as it existed on July 1, 2000), and is certified to zero-emission vehicle standards.

~~(5)~~(4) “Placed in service” means having been sold or leased to an end-user and not to a dealer or other distribution chain entity, and having been individually registered for on-road use by the California Department of Motor Vehicles.

(5) “Specialty electric vehicle” means a version of an existing electric vehicle that is designed for a commercial or governmental fleet application, and has the same battery pack and chassis as the existing electric vehicle from which it is modified.

*Commentary: This post-hearing modification accompanies the modification in section (d)(3)(C)1. pertaining to extended range multipliers for specialty electric vehicles.*

~~(f)~~(j) *Abbreviations.* The following abbreviations are used in this section 1962:

“AER” means all-electric range.

“BEV” means battery electric vehicle.

“CMPEG” means California miles per equivalent gallon.

“HEV” means hybrid-electric vehicle.

“~~HF~~EDS” means highway fuel economy driving cycle.

“LDT” means light-duty truck.

“LDT1” means a light-truck with a loaded vehicle weight of 0-3750 pounds.

“LDT2” means a “LEV II” light-duty truck with a loaded vehicle weight of 3751 pounds to a gross vehicle weight of 8500 pounds, or a “LEV I” light-duty truck with a loaded vehicle weight of 3751-5750 pounds.

“MDV” means medium-duty vehicle.

“Non-Methane Organic Gases” or “NMOG” means the total mass of oxygenated and non-oxygenated hydrocarbon emissions.

“NEV” means neighborhood electric vehicle.

“NOx” means oxides of nitrogen.

“PC” means passenger car.

“PZEV” means any vehicle that is delivered for sale in California and that qualifies for a partial ZEV allowance of at least 0.2.

“SOC” means state of charge.

“SULEV” means super ultra-low-emission-vehicle.

“UDDS” means urban dynamometer driving cycle.

“ULEV” means ultra-low emission vehicle.

“VMT” means vehicle miles traveled.

“ZEV” means zero-emission vehicle.

Note: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43104 and 43105, Health and Safety Code. Reference: Sections 39002, 39003, 39667, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43107, 43204, and 43205.5, Health and Safety Code.

Amend title 13, CCR, section 1900 to read as follows:

**§ 1900. Definitions.**

[Subsections ~~(a)~~(b)(1) through ~~(17)~~(18) -- No change]

(19) “Intermediate volume manufacturer” means any pre-2001 model year manufacturer with California sales between 3,001 and ~~35,000~~ 60,000 new light- and medium-duty vehicles per model year based on the average number of vehicles sold by the manufacturer each model year from 1989 to 1993; any 2001 through 2002 model year manufacturer with California sales between 4,501 and ~~35,000~~ 60,000 new light- and medium-duty vehicles per model year based on the average number of vehicles sold by the manufacturer each model year from 1989 to 1993; and any 2003 and subsequent model year manufacturer with California sales between 4,501 and ~~35,000~~ 60,000 new light- and medium-duty vehicles based on the average number of vehicles sold for the three previous consecutive model years for which a manufacturer seeks certification. For a manufacturer certifying for the first time in California, model year sales shall be based on projected California sales.

(20) “Large volume manufacturer” means any 2000 and subsequent model year manufacturer that is not a small volume manufacturer, or an independent low volume manufacturer, or an intermediate manufacturer.

(21) “Independent low volume manufacturer” means a manufacturer with California annual sales of less than 10,000 new passenger cars, light-duty trucks and medium-duty vehicles following aggregation of sales pursuant to this section 1900(a)(20). Annual sales shall be determined as the average number or sales sold for the three previous consecutive model years for which a manufacturer seeks certification; however, for a manufacturer certifying for the first time in California, annual sales shall be based on projected California sales for the model year. The annual sales from different firms shall be aggregated in the following situations:

(A) Vehicles produced by two or more firms, one of which is 10% or greater part owned by another;

(B) Vehicles produced by any two or more firms if a third party has equity ownership of 10% or more in each of the firms;

(C) Vehicles produced by two or more firms having a common corporate officer(s) who is (are) responsible for the overall direction of the companies;

(D) Vehicles imported or distributed by all firms where the vehicles are manufactured by the same entity and the importer or distributor is an authorized agent of the entity.

*Commentary: The changes in subsection numbering correct errors in the original Proposed Regulation Order, which did not accurately reflect the existing numbering in Barclays California Code of Regulations. The text does not show subsequent amendments, approved by the Board at a June 28, 2001 hearing, that*



*pertain to the effect of joint ownership on small and intermediate volume manufacturers. The subsequent amendments will not affect the amendments approved by the Board at the January 25 hearing.*

Note: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, and 43104 Health and Safety Code.  
Reference: Sections 39002, 39003, 39010, 39500, 40000, 43000, 43013, 43100, 43101, 43101.5, 43102, 43104, 43106, and 43204, Health and Safety Code.

Amend section 1960.1(k), Title 13, California Code of Regulation, to read as follows:

(k) The test procedures for determining compliance with these standards are set forth in “California Exhaust Emission Standards and Test Procedures for 1981 through 1987 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles,” adopted by the state board on November 23, 1976, as last amended May 20, 1987, and in “California Exhaust Emission Standards and Test Procedures for 1988 through 2000 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles,” adopted by the state board on May 20, 1987 as last amended August 5, 1999, both which are incorporated herein by reference, and in “California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles,” as incorporated by reference in section 1961(d). The test procedures for determining the compliance of 2001 through 2006 model-year hybrid electric vehicles with the standards set forth in this section are set forth in “California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck, and Medium-Duty Vehicle Classes, as incorporated by reference in section 1962~~(e)~~(h).

\* \* \* \*

Note: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43104 and 43105, Health and Safety Code. Reference: Sections 39002, 39003, 39667, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43107, 43204, and 43205.5, Health and Safety Code.

Amend section 1961(a)(8)(B) and 1961(d), title 13, California Code of Regulations, to read as follows:

(8) *Requirements for Vehicles Certified to the Optional 150,000 Mile Standards.*

(A) *Requirement to Generate Additional Fleet Average NMOG Credit.* A vehicle that is certified to the 150,000 mile standards in section 1961(a) shall generate additional NMOG fleet average credit as set forth in 1961(b)(1) or additional vehicle equivalent credits as set forth in 1961(b)(2) provided that the manufacturer extends the warranty on high cost parts to 8 years or 100,000 miles, whichever occurs first, and agrees to extend the limit on high mileage in-use testing to 105,000 miles.

(B) *Requirement to Generate a Partial ZEV Allowance.* A vehicle that is certified to the 150,000 mile SULEV standards shall also generate a partial ZEV allocation according to the criteria set forth in section C.3 of the “California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,” incorporated by reference in section 1962(e)(h).”

\* \* \* \*

(d) *Test Procedures.* The certification requirements and test procedures for determining compliance with the emission standards in this section are set forth in the “California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles,” adopted on August 5, 1999, as amended on December 27, 2000, which is incorporated herein by reference. In the case of hybrid electric vehicles, the certification requirements and test procedures for determining compliance with the emission standards in this section are set forth in the “California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles, and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes,” incorporated by reference in section 1962(e)(h).

\* \* \* \*

Note: Authority cited: Sections 39600, 39601, 43013, 43018, 43101, 43104 and 43105, Health and Safety Code. Reference: Sections 39002, 39003, 39667, 43000, 43009.5, 43013, 43018, 43100, 43101, 43101.5, 43102, 43104, 43105, 43106, 43107, 43204, and 43205.5, Health and Safety Code.

**PROPOSED AMENDMENTS TO  
“CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR  
2003 AND SUBSEQUENT MODEL ZERO-EMISSION VEHICLES, AND 2001 AND  
SUBSEQUENT MODEL HYBRID ELECTRIC VEHICLES, IN THE PASSENGER CAR,  
LIGHT-DUTY TRUCK AND MEDIUM-DUTY VEHICLE CLASSES”**

\* \* \* \*

**C. Zero-Emission Vehicle Standards.**

*[Incorporate all modifications proposed for title 13, California Code of Regulations, section 1962, “Zero-Emission Vehicle Standards for New 2003 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles.” The complete modified text is available on the ARB’s Internet site for this rulemaking, –  
<http://www.arb.ca.gov/regact/zev2001/zev2001.htm>]*

\* \* \* \*

**E. Test Procedures**

\* \* \* \*

**3. All-Electric Range Test.** *[No amendments or modifications to first paragraph]*

\* \* \* \*

~~(a)~~ **3.1 Cold soak.** The vehicle shall be stored at an ambient temperature not less than 68°F (20°C) and not more than 86°F (30°C) for 12 to 36 hours. During this time, the vehicle’s battery shall be charged to a full state-of-charge.

~~(a)~~ **3.2 Driving schedule.**

~~(a)~~ **3.2.1 Determination of All-Electric Range-Urban.**

~~(a)~~ At the end of the cold soak period, the vehicle shall be placed, either driven or pushed, onto a dynamometer and operated through successive Urban Dynamometer Driving Schedules (UDDS), 40 CFR, Part 86, Appendix I, which is incorporated herein by reference, ~~until the vehicle is no longer able to maintain the speed or time tolerances contained in 40 CFR § 86.115-00(b)(1) and (2).~~ A 10-minute soak shall follow each UDDS cycle.

~~(b)~~ For vehicles with a maximum speed greater than or equal to the maximum speed on the UDDS cycle, this test sequence shall be repeated until the vehicle is no longer able to maintain either the speed or time tolerances in 40 CFR § 86.115-00 (b)(1) and (2), or the manufacturer determines that the test should be terminated for safety

reasons, e.g. excessively high battery temperature, abnormally low battery voltage, etc. For off-vehicle charge capable hybrid electric vehicles, this determination shall be performed without the use of the auxiliary power unit.

(c) For vehicles with a maximum speed less than the maximum speed on the UDDS cycle, the vehicle shall be operated at maximum available power (or full throttle) when the vehicle cannot achieve the speed trace within the speed and time tolerances specified in 40 CFR § 86.115-00(b)(1) and (2). The test shall be terminated when the vehicle speed when operated at maximum available power (or full throttle) falls below 95 percent of the maximum speed initially achieved on the UDDS cycle or when the battery state-of-charge is depleted to the lowest level allowed by the manufacturer, or the manufacturer determines that the test should be terminated for safety reasons, e.g. excessively high battery temperature, abnormally low battery voltage, etc., whichever occurs first. For off-vehicle charge capable hybrid electric vehicles, this determination shall be performed without the use of the auxiliary power unit.

*Commentary: Under the existing all electric range-urban test procedure, City EVs that cannot meet the high speed portion of the test requirement have the test terminated immediately and are assigned an inaccurately low range. The revised language would allow such vehicles to continue the test cycle and would result in more representative range test results.*

#### **3.2.2      Determination of All-Electric Range-Highway.**

(a) At the end of the cold soak period, the vehicle shall be placed, either driven or pushed, onto a dynamometer and operated through two successive Highway Fuel Economy Driving Schedules (HFEDS), ~~found in 40 CFR, Part 600, Appendix I, which is incorporated herein by reference, the speed or time tolerances contained in 40 CFR § 86.115-00(b)(1) and (2).~~ There shall be a 15 second zero speed with key on and brake depressed between two cycles and a 10-minute soak following the two HFEDS cycles.

(b) For vehicles with a maximum speed greater than or equal to the maximum speed on the HFEDS cycle, this test sequence shall be repeated until the vehicle is no longer able to maintain either the speed or time tolerances in 40 CFR § 86.115-00 (b)(1) and (2), or the manufacturer determines that the test should be terminated for safety reasons, e.g. excessively high battery temperature, abnormally low battery voltage, etc. For off-vehicle charge capable hybrid electric vehicles, this determination is optional and shall be performed without the use of the auxiliary power unit.

(c) For vehicles with a maximum speed less than the maximum speed on the HFEDS cycle, the vehicle shall be operated at maximum available power (or full throttle) when the vehicle cannot achieve the speed trace within the speed and time tolerances specified in 40 CFR § 86.115-00(b)(1) and (2). The test shall be terminated when the vehicle speed when operated at maximum available power (or full throttle) falls below 95 percent of the maximum speed initially achieved on the HFEDS cycle or when the battery state-of-charge is depleted to the lowest level allowed by the manufacturer, or the

manufacturer determines that the test should be terminated for safety reasons, e.g. excessively high battery temperature, abnormally low battery voltage, etc., whichever occurs first. For off-vehicle charge capable hybrid electric vehicles, this determination shall be performed without the use of the auxiliary power unit.

(d) NEVs are exempt from the all-electric range highway test.

***Commentary:** See above. In addition, the exclusion for NEVs is added to the highway range test procedure because such vehicles will not be used on the highway.*

~~(3)~~ 3.2.3      **Recording requirements.** *[No other amendments]*

~~(4)~~ 3.2.4      **Regenerative braking.** *[No other amendments]*

\* \* \* \*